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**Digital Transformation In Smes: A Case Study Of Woman-Owned Enterprises In Hue City**

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**ABSTRACT**

This study explores the current state and strategic implications of digital transformation (DT) among women-owned small and medium-sized enterprises (SMEs) in Hue City, Vietnam. Despite a growing emphasis on digitalization across various sectors, SMEs led by women continue to face significant challenges in adopting digital solutions effectively. Using the Importance-Performance Analysis (IPA) methodology, the research surveyed 195 women-owned enterprise across multiple service and manufacturing sectors. The findings reveal that while certain digital practices—such as basic internet connectivity and customer relationship management (CRM) systems—are well adopted, several critical DT dimensions remain underdeveloped. These include the adoption of advanced technologies, formation of digital strategies, cultivation of ICT culture, and effective management of data and information assets. The analysis identified "gaps" where high-importance attributes are met with low performance, indicating urgent areas for intervention. The study highlights barriers such as financial constraints, limited technical capacity, inadequate infrastructure, and internal resistance to change. Strategic solutions are proposed across six core dimensions: customer experience, strategy, infrastructure, operations, digital culture, and data management. These include promoting omnichannel strategies, enhancing employee digital competencies, integrating cloud and IoT solutions, and fostering a transparent ICT culture. The paper emphasizes the need for targeted policy interventions and training programs tailored to the unique needs of women entrepreneurs. Ultimately, the study provides practical recommendations to bridge performance gaps and accelerate the digital transformation of women-owned SMEs in Hue city, contributing to broader economic inclusion and regional development.

**Keywords:** digital transformation, SMEs, woman-owned enterprise

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## 1. INTRODUCTION

According to preliminary statistical data, enterprises owned by women currently account for approximately 24–25% of the total number of businesses nationwide. These women-led enterprises are primarily concentrated in the wholesale and retail service sectors (accounting for around 75%), followed by the manufacturing and processing industries (14.6%), and the science and technology sector (7.3%) (MBI et al., 2016).

A report from the Department of Planning and Investment of Hue city indicates that there are currently about 6,000 active enterprises in the province, with nearly 30% of them owned by women. Women-owned businesses are increasingly expanding, and many female entrepreneurs and women-led startups have achieved notable accomplishments in production and business activities.(TTH Provincial Statistics Office, 2023).

Notably, numerous women-led enterprises are actively engaged in the production of handicrafts, traditional crafts, and environmentally friendly products. Some have also contributed to the development of community-based tourism, thereby creating livelihoods for local residents and contributing to the socio-economic development of their regions.

It can be said that women-owned enterprises are playing a vital role in generating employment and income, reducing poverty, and promoting economic growth. In the current context, Vietnamese businesses, particularly small and SMEs led by women, are facing significant challenges and the far-reaching impacts of the COVID-19 pandemic. This crisis has profoundly altered people's lives and habits, creating unprecedented difficulties and challenges, thereby compelling businesses to transform and adapt.

In the face of rapid technological advancement, businesses, particularly women-owned enterprises, are gradually incorporating technological innovations into their operations (Popović-Pantić et al., 2019). Among these, digital transformation is crucial in enabling businesses to navigate and adapt to change effectively. Digital transformation refers to the integration of digital technologies into the operations of enterprises and organizations, fundamentally changing how they function, structure their business models, and deliver new value to customers. In other words, it is a transformation in management approaches, operational processes, procedures, and organizational culture, built upon digital platforms and aimed at achieving greater efficiency.

Digital transformation has a significant impact on business operations, prompting an increasing number of enterprises to recognize its importance and transformative role. Businesses are now more aware of the necessity to adapt, especially in the face of evolving consumer behaviors, the growing availability of advanced technologies, and the readiness of digital transformation service providers (Nga et al, 2023).

Nonetheless, Vietnamese enterprises, particularly small and SMEs owned by women, encounter numerous challenges and barriers in the digital transformation process. These include financial constraints, limited capacity and expertise in implementation, and insufficient access to information about appropriate digital solutions. Such limitations hinder their ability to fully leverage the benefits of digital transformation, despite the existing favorable conditions such as technological readiness and shifting consumer habits (Thanh&Hiệp, 2019). In addition, many enterprises remain hesitant to pursue digital transformation due to concerns about data privacy and

the potential leakage of personal and corporate information during the transformation process. Other significant obstacles include limited managerial capacity, lack of information on digital technologies, inadequate digital infrastructure, and financial difficulties associated with investing in and applying digital solutions.

In response to these challenges, the Ministry of Planning and Investment, in collaboration with Australia's USAID organization, has launched support and advisory initiatives to help women-led enterprises accelerate their digital transformation efforts. Aligned with this national policy, the Department of Planning and Investment of Hue City has also implemented a range of capacity-building activities specifically designed to support women-owned enterprises in their digital transformation journeys.

Given this context, assessing the current state of digital transformation among small and medium-sized women-owned enterprises in Hue city has become an urgent priority. Such an assessment is essential for developing a comprehensive understanding of the situation and identifying the specific challenges that female entrepreneurs are encountering in their efforts to digitize business operations. The primary purpose of this study is to assess the current state of digital transformation (DT) among women-owned small and medium-sized enterprises (SMEs) in Hue City, Vietnam, with the aim of identifying strategic gaps and proposing tailored solutions for improvement. In response to the rising global emphasis on digitalization, the research addresses the persistent challenges these enterprises face in adopting digital technologies effectively, including financial limitations, low digital capacity, underdeveloped infrastructure, and resistance to organizational change. Utilizing the Importance-Performance Analysis (IPA) methodology—specifically the GAP 1 model—the study evaluates 195 women-owned businesses across various sectors to reveal discrepancies between the perceived importance of DT attributes and their actual implementation. The research is structured around six critical dimensions: customer experience, strategy, infrastructure, operations, digital culture, and data and information management. By highlighting performance deficiencies in key areas such as advanced technology adoption, strategic planning, employee readiness, and ICT culture, the study contributes practical, context-specific recommendations aimed at accelerating digital adoption. Ultimately, this work seeks to inform both policy and practice, supporting more inclusive and resilient digital ecosystems for female entrepreneurs in the region.

## 2. METHODOLOGY

### 2.1. *The concepts*

#### 2.1.1. *Concept of Digital Transformation (DT)*

Digital transformation (DT) is broadly understood as the transformation in how organizations operate, create value—such as new business models, products, and services—and communicate, through the utilization of digital technologies(Gašperlin et al., 2021). Verhoef et al. (2021) define digital transformation as the manner in which organizations adopt digital technologies to evolve their business models and generate greater value. While a universally accepted definition remains elusive, existing conceptualizations emphasize the central role of digital technology and its effectiveness in reshaping organizational functions and competitive advantages. In essence, DT refers to an organization's approach to accessing and applying digital technologies to enhance

business efficiency, increase competitive edge, and unlock new sources of value through the innovation of business models (Verhoef et al., 2021).

According to Vietnam's Ministry of Planning and Investment, digital transformation in enterprises entails the integration and application of digital technologies aimed at improving business operations and management efficiency, while generating novel value for the firm. This may encompass a range of activities—from digitizing administrative and operational data, to applying digital solutions for process automation, optimizing business and production workflows, and even reinventing entire business models to create new value (Ministry of Planning and Investment\_USAID, 2021).

Internationally, digital transformation has garnered significant scholarly attention, with contributions from (Gašperlin et al., 2021; Laorach & Tuamsuk, 2022; Matyushkina & Seregina, 2023; Stich et al., 2020; Trenkle, 2020; Zhang et al., 2023) A common feature of these studies is their focus on identifying the factors that influence the scope and success of digital transformation, especially within small and medium-sized enterprises (SMEs). In Vietnam, the concept of DT has only recently gained popularity but is rapidly permeating across various sectors. Several studies have investigated the digital transformation of Vietnamese SMEs, focusing on their current status and related challenges. Some researchers have narrowed their scope to specific regions, such as the work by (Vũ Văn et al., 2022), which examines DT in central Vietnam. However, research specifically addressing digital transformation in women-owned SMEs remains virtually absent, presenting a critical gap that this study aims to fill.

#### *2.1.2. The Role of Digital Transformation in Business Development*

Digital transformation is becoming an indispensable trend as enterprises integrate into the globalized economy. According to (Vũ Văn et al., 2022), DT facilitates improved internal coordination by connecting departments, thereby enhancing corporate governance, maximizing employee productivity, and fostering innovation and creativity in production. These advancements contribute to product quality improvement and, ultimately, increased competitiveness. Additionally, automation enabled by DT reduces the need for manual labor and lowers production costs. Moreover, DT ensures that information is regularly and accurately communicated to economic stakeholders (Hàng & Thuý, 2022).

Digital transformation also fosters the emergence and development of new business models aligned with sustainability principles. As a result, it plays a key role in steering the economy toward more sustainable development trajectories (Tuyễn & Đạo, 2022).

#### *2.1.3. Characteristics of Women-Owned Enterprises*

Vietnam ranks favorably in gender equality relative to countries at comparable development levels, especially in terms of women's participation in economic and social life. Currently, Vietnam has approximately 95,906 formally registered women-owned SMEs, accounting for over 21% of the national total. Of these, 57% (55,049) are microenterprises with annual revenues below USD 100,000. About 42% (40,003) are classified as small or medium-sized enterprises with annual revenues between USD 100,000 and USD 15 million, while only 1% (854) are large enterprises generating over USD 15 million annually(IFC, 2017).

While Vietnam does not have an official legal definition of a "women-owned enterprise," studies—particularly those funded by the International Finance Corporation (IFC)—typically adopt the World Bank's classification. Under this framework, an enterprise is considered women-owned if a woman holds a key executive or managerial role (e.g., CEO) (MBI et al., 2016). According to the same source, women-owned enterprises in Vietnam generally exhibit three characteristics: they are often small or micro-sized, they predominantly operate in the service sector, and their share diminishes as business size increases.

Despite their growing presence, women-owned enterprises face numerous challenges. Financial access remains a key barrier for women entrepreneurs during both the startup and operational phases. Other notable obstacles include a lack of female role models, persistent gender stereotypes, weaker business networks, difficulties balancing professional and personal responsibilities, and gender-based disparities across industries. Cultural attitudes—such as the fear of failure—tend to impact women more than men, hindering entrepreneurial confidence (Popović-Pantić et al., 2019). Furthermore, female business owners are often excluded from trade promotion activities and face disadvantages in building business networks. They also must contend with traditional expectations surrounding household duties, such as child-rearing and family caregiving, which further constrain their ability to fully engage in entrepreneurial ventures (MBI et al., 2016).

## 2.2. Theoretical framework

The Importance-Performance Analysis (IPA) method was first introduced in the context of customer satisfaction research, based on a function that considers both customer expectations, which relate to the perceived importance of various attributes, and their perceived performance. This analytical approach helps identify which factors are performing well and which require improvement by mapping them on a two-dimensional grid. Through this, businesses and researchers can prioritize resources effectively, focusing on attributes that are both critical to stakeholders and underperforming (Martilla et al., 1977). IPA is a method that provides a two-dimensional perspective by simultaneously examining both importance and performance. In this approach, values of importance and performance across various attributes are plotted together, typically within a four-quadrant matrix. This performance-importance space allows for clear visualization of how well an organization is performing in areas that matter most to its stakeholders.

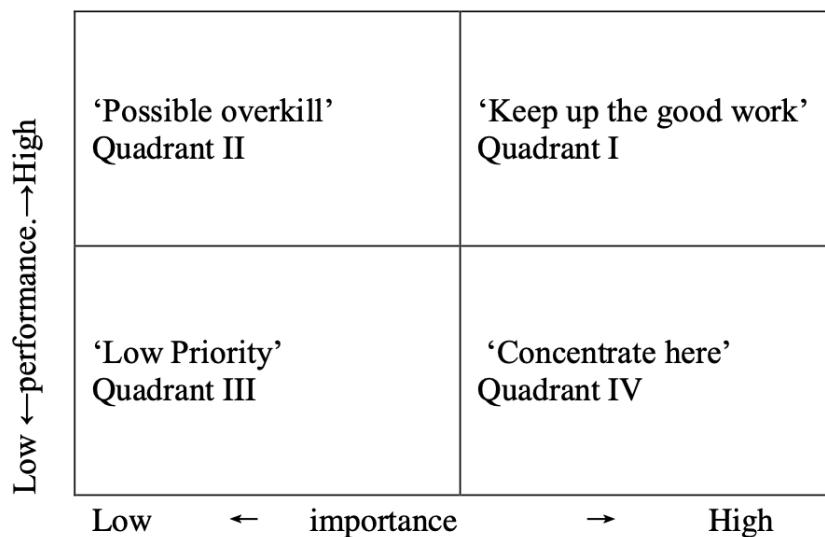
For businesses, the positioning of attributes within these quadrants serves as a strategic tool for decision-making. Attributes that fall into the "High Importance-Low Performance" quadrant indicate critical areas requiring immediate improvement. Conversely, attributes in the "High Importance-High Performance" quadrant reflect strengths that should be maintained. Less critical are those in the "Low Importance-High Performance" quadrant—often considered over-invested areas—and "Low Importance-Low Performance" attributes, which may be of lower strategic priority. Through this analysis, managers can effectively identify performance gaps, allocate resources efficiently, and prioritize initiatives that enhance overall organizational effectiveness (Shieh & Wu, 2009). There are four main approaches to IPA, each offering different perspectives and analytical depth:

- Traditional IPA: This is the classic form of IPA, where performance and importance ratings for various attributes are collected from respondents and plotted on a two-

dimensional grid. It helps identify strengths, weaknesses, and areas for strategic improvement by classifying attributes into four quadrants.

- IPA with GAP 1 (Performance–Importance Discrepancy Analysis): This approach focuses on analyzing the gaps between perceived performance and perceived importance for each attribute. A large negative gap indicates a potential weakness requiring improvement, while a small or positive gap suggests alignment between customer expectations and delivered performance.
- IPA with GAP 2 (Competitor-Based IPA): This method involves comparing the importance and performance scores of a firm's attributes with those of competitors. It helps assess competitive positioning and identify areas where an organization is outperforming or lagging behind rival firms, providing insights for benchmarking and strategic differentiation.
- IPA with the Three-Factor Theory (Current vs. Future Importance): Based on the three-factor theory of customer satisfaction, this version analyzes current importance of attributes in relation to their future importance. It categorizes attributes into basic needs, performance needs, and excitement needs, helping organizations anticipate shifts in customer expectations and adjust priorities proactively.

Each of these IPA approaches serves a unique strategic purpose, allowing organizations to adapt the methodology based on their goals, be it internal improvement, competitive analysis, or forward-looking planning (Feng et al., 2014). In this study, we applied IPA with GAP 1 to examine the current situation of digital transformation in women-owned enterprises in Hue city.



*Fig. 1. IPA analysis method*

Source:: (Martilla et al., 1977)

In the IPA framework, the horizontal axis represents the *importance* of various attributes, while the vertical axis reflects the *performance* level, such as customers' perceptions of service quality. The matrix is typically divided into four quadrants, each carrying a distinct strategic implication:

Quadrant I: High Importance – High Performance ("Keep up the good work")  
 Attributes in this quadrant are both important to customers and are being performed well. These

represent core strengths and should be maintained consistently to sustain customer satisfaction and loyalty.

Quadrant II: Low Importance – High Performance ("Possible Overkill") Attributes here are not considered very important by customers, yet the business is performing well in them. This may indicate an over-allocation of resources, and thus, businesses could consider reallocating efforts to more critical areas.

Quadrant III: Low Importance – Low Performance ("Low Priority") Attributes in this area are of minimal importance and are also underperforming. These are low-priority areas that do not require immediate attention unless circumstances change.

Quadrant IV: High Importance – Low Performance ("Concentrate Here") This quadrant is the most strategically critical. Attributes here are very important to customers but are currently underperforming. These represent key weaknesses that require urgent improvement and resource focus to avoid dissatisfaction and potential customer loss.

This IPA grid allows managers to visually identify and prioritize performance improvements in line with customer expectations, leading to more effective decision-making and strategic planning.

### **2.3. Sampling method**

The sample was selected using a non-probability sampling method, with the sample size determined based on the following formula:

$$n = \frac{N}{1 + Ne^2}$$

Where:

- $n$  is the required sample size,
- $N$  is the population size ( $N = 1,890$ ),
- $e$  is the permissible margin of error ( $e = 0.07$ ).

Applying the formula, the calculated sample size is 194. In practice, the study surveyed 200 enterprises. However, 5 questionnaires were deemed invalid, resulting in a final sample size of 195 valid responses used for data analysis.

### **2.4. Data analysis method**

The primary data collected in the study were processed using Microsoft Excel. This software was employed for data cleaning, organization, and basic statistical analysis, enabling the preparation of the dataset for further interpretation and evaluation.

### **2.5. Proposed Measurement Scale for the IPA-GAP Matrix**

The proposed measurement scale is designed based on the enterprise digital transformation evaluation index set, combined with insights gathered from expert interviews and a review of relevant literature. The study constructs an assessment framework for evaluating the current state of digital transformation in enterprises, structured around six core dimensions:

- Customer Experience
- Strategy
- Infrastructure

- Operations
- Organizational Digital Culture
- Data and Information Assets

Based on these six dimensions, a total of 25 evaluation criteria have been developed. These criteria serve as a basis for enterprises to assess:

- The perceived importance of each attribute
- The current level of implementation/performance

Both are measured using a 5-point Likert scale,

*Table 1. Measurement scale*

No	Factors	Code	References
I	CUSTOMER EXPERIENCE		
1	Enterprises apply digital technologies in marketing, distribution, and sales (omni-channel) to enhance customer experience and create competitive advantages in the market.	TN1	Bộ Thông tin và truyền thông (2021), Nguyễn Thị Mai Hương và Bùi Thị Sen (2021)
2	Enterprises adopt digital technologies in customer service to develop a differentiated customer experience	TN2	
3	The enterprise's Customer Relationship Management (CRM) system can integrate with other systems and be easily upgraded to incorporate additional functionalities	TN3	
4	Enterprises implement information technology systems and data analytics to measure the performance of marketing, sales, and customer service activities.	TN4	
5	Enterprises apply data analytics to analyze and forecast sales performance, thereby providing a basis for adjusting marketing, sales, and customer service strategies	TN5	
II	STRATEGY		
6	The digital transformation process of an enterprise is driven by both its digital transformation strategy and overall business strategy.	CL1	(Lanzolla & Anderson, 2008); (Ulas, 2019); (Gamache et al., 2019); (Chử Bá Quyết, 2021);

No	Factors	Code	References
7	Executives incorporate digital transformation initiatives into the strategic orientation of the enterprise.	CL2	Ministry of Information and Communications, 2021)
8	Enterprises consistently prioritize and invest in technological initiatives to enhance business performance and management efficiency	CL3	
9	Enterprises adopt information technology systems and data analytics to support strategic activities such as capital mobilization and the identification of strategic investors	CL4	
<b>III INFRASTRUCTURE</b>			
10	The enterprise has established network connectivity, including broadband and wireless Internet access	HT1	Lanzolla et al., (2008); Bộ Thông tin và truyền thông (2021); Le et al. (2023)
11	The enterprise has adopted basic digital technologies, such as the use of LAN networks, Internet access, electronic invoicing, and digital records	HT2	
12	The enterprise has adopted advanced digital technologies, including cloud storage, 5G mobile technology, IoT solutions, and ERP software	HT3	
13	The enterprise has implemented digital technologies in production and manufacturing activities, such as robotics, automation, 3D printing, and automatic brand/product recognition technologies	HT4	
<b>IV OPERATIONS</b>			
14	Employees possess sufficient competencies in utilizing the existing digital systems	VH1	Bộ Thông tin và truyền thông (2021), Gamache et al., (2019)
15	Employees demonstrate a willingness to learn and adopt new digital systems	VH2	

No	Factors	Code	References
16	The enterprise has a dedicated IT department responsible for managing its information technology systems	VH3	
17	The enterprise has developed an online knowledge and expertise repository	VH4	
18	The enterprise has a policy to attract high-quality talent in technology within its operational domain	VH5	
V	DIGITAL TRANSFORMATION IN ENTERPRISE'S CULTURE		
19	The enterprise has established an 'ICT culture,' where employees work in an internet-based environment, use company domain emails, participate in online meetings, and utilize office software and smartphones for work-related tasks	CD1	Bộ Thông tin và truyền thông (2021), Gamache et al., (2019); Le et al., (2023)
20	The enterprise has an R&D department to foster a culture of innovation, creativity, and the application of digital technologies	CD2	
21	Each individual within the enterprise engages in a culture of sharing knowledge and experiences related to digital transformation	CD3	
VI	DATA AND INFORMATION ASSETS		
22	The enterprise regularly updates its technological solutions by adopting the latest offerings from market providers	DL1	Bộ Thông tin và truyền thông (2021), Gamache et al., (2019)
23	The enterprise has adopted new technologies such as cloud computing, mobile technology, etc., to minimize costs and enhance the efficiency of its information technology systems	DL2	
24	The enterprise's current IT systems and solutions are capable of seamlessly integrating with new technological solutions	DL3	

No	Factors	Code	References
25	The enterprise has policies and processes in place regarding the collection, storage, and analysis of data to support business decision-making	DL4	

### **Customer Experience**

According to the set of indicators used to assess the level of DT in enterprises and to support the promotion of DT, customer experience is measured through two key indicators: online presence and online activity (Thông, 2021). Based on this framework, the study expanded the customer experience scale to five indicators to evaluate customers' digital experience in the areas of marketing and distribution, customer service, and engagement with the enterprise.

### **Strategy**

The strategy pillar in the enterprise digital transformation assessment framework focuses solely on the criterion of formulating a DT strategy or plan. Drawing on the assessment framework and relevant literature, this study developed a four-indicator scale to assess strategic aspects of the DT process, including leadership initiatives, enterprise investment, and the application of information technology.

### **Infrastructure**

According to the digital transformation assessment framework, the infrastructure criterion emphasizes two core components: network connectivity and ICT infrastructure.

### **Operations**

In the assessment framework, the operations pillar includes two main criteria: ICT management policies and human resources. Based on a review of relevant literature, this study expanded the operational indicator set to include the following: employee competencies, readiness to learn and accept new digital systems, the presence of an IT department, the development of online knowledge and expertise repositories, and policies for attracting high-quality talent.

### **Digital Transformation of Enterprise's Culture**

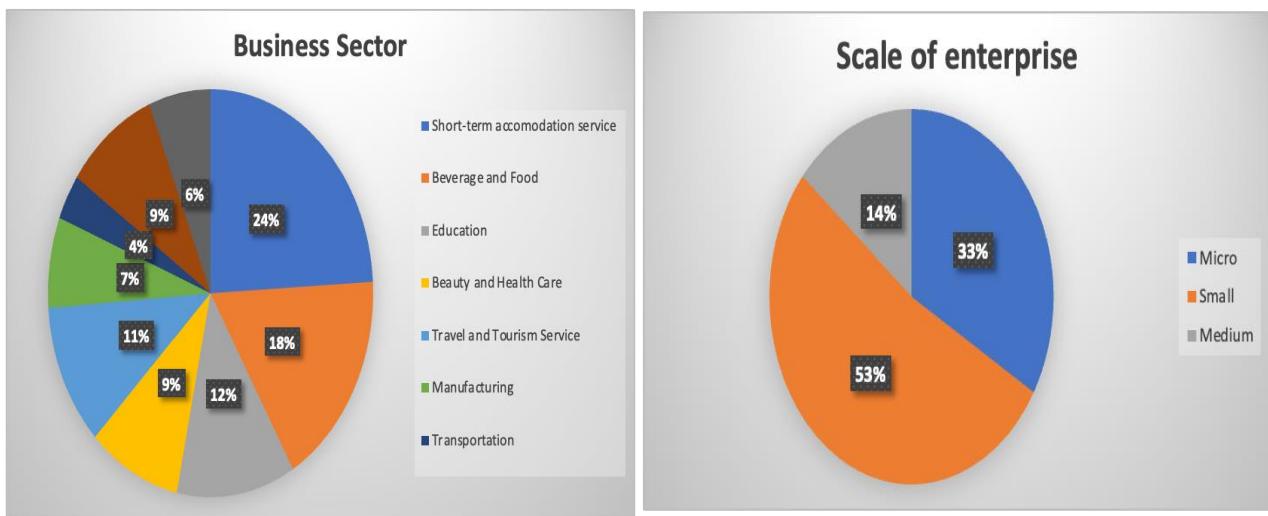
Corporate culture is the sixth pillar in the DT assessment framework issued by the Ministry of Information and Communications, comprising two key indicators: use of ICT and R&D infrastructure. This study further developed the framework by adding three indicators: the presence of an ICT culture within the enterprise, the development of R&D departments, and the promotion of a culture of knowledge and experience sharing in DT.

### **Data and Information Assets**

This is the final pillar in the enterprise DT assessment framework by the Ministry of Information and Communications, and it focuses on a single criterion: data utilization and management. Based on a review of related studies, this research expanded the indicator set to include four additional criteria: the status of updates to technological solutions, adoption of new technologies, integration capability of technological solutions, and policies and procedures related to data collection, storage, and analysis.

### 3. RESULTS

#### 3.1. Description of sample

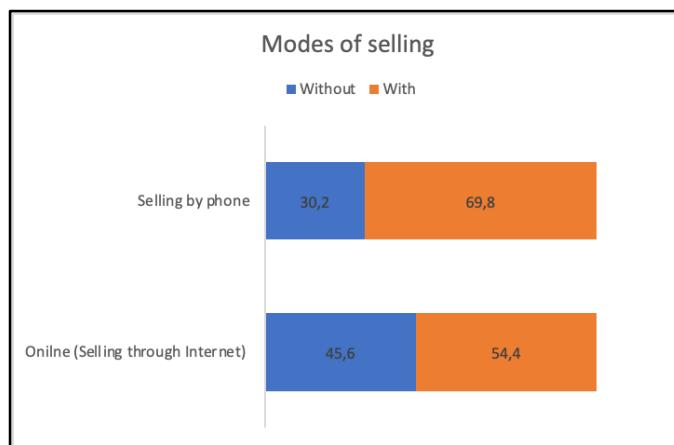


*Fig.2&3. Business sector and scale of enterprise*

Source: Authors' analysis, 2024

In the surveyed business sectors, the majority are short-term accommodation businesses, accounting for 24.1%. Other types of businesses include restaurants/cafés/bars (17.4%); educational support services (11.8%); healthcare and beauty services (9.2%); and travel and tourism services (11.3%). Manufacturing, transportation, and retail sectors account for 7.2%, 3.6%, and 9.2%, respectively, while other sectors represent 6.2%. Regarding business size, 52.6% of the surveyed enterprises have between 10 and 100 employees. This is followed by businesses with fewer than 10 employees (33.3%) and those with between 101 and 200 employees (13.9%).

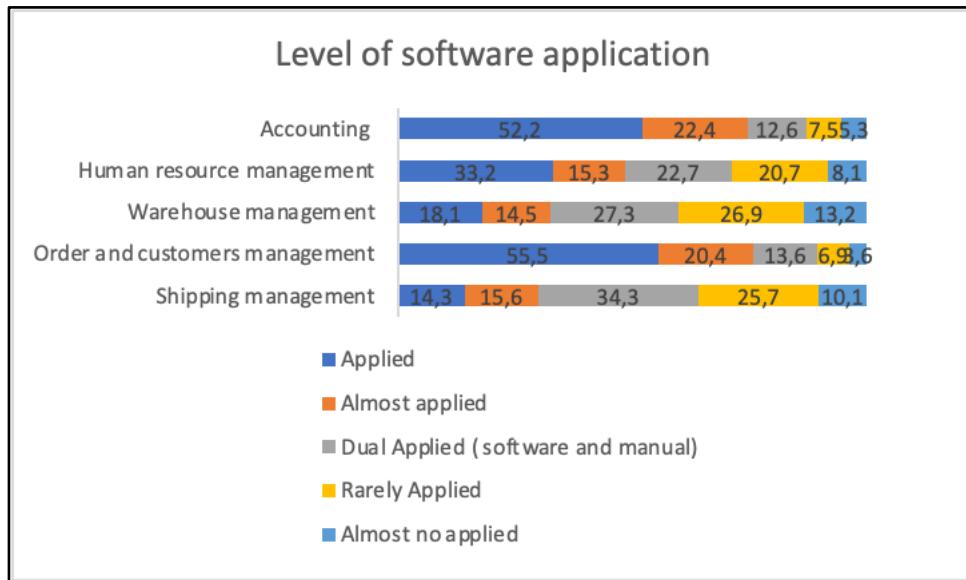
The survey results indicate that the first step in digital transformation taken by small and medium-sized enterprises (SMEs) led by women is the application of technology in sales operations. In addition to traditional sales methods, 69.8% of the surveyed businesses have adopted phone sales, and 54.4% have utilized internet sales with the support of online sales platforms (e.g., Shopee, Lazada, Tiki) and social media platforms (e.g., Facebook, Zalo).



*Fig.4. Modes of selling*

Source: Authors' analysis, 2024

Regarding the level of software application in managing business operations, the surveyed enterprises primarily use software for accounting, customer order management, and human resource management. Nearly 80% of the businesses surveyed apply software for managing customer orders, as most of the businesses operate in the service sector. Managing orders and customers are two activities that directly impact the organization's revenue and profit, making them a priority for investment. Additionally, accounting and order management are widely utilized, while inventory and transportation management are less frequently supported by software. This is because the surveyed enterprises are not heavily involved in manufacturing, with only about 35% of businesses investing in software for inventory management, primarily within the retail sector.



*Fig.5. Level of software application*

Source: Authors' analysis, 2024

### **3.2. GAP Matrix Analysis of the Current State of Digital Transformation in Women-Owned SMEs in Hue city**

#### *3.2.1. Gap Matrix Analysis for Customer Experience*

"Right Direction Development" Group: According to the survey results, this group focuses on applying digital technology in customer care to create differentiated customer services. This criterion was rated by businesses with a high level of importance and performance, each scoring above 4 points. This indicates that it is a critical factor for the future and has already been relatively well implemented by the enterprises. It is considered a strength in the digital transformation efforts of women-owned SMEs in Hue city.



*Fig.6. Gap matrix for Customer experience*

Source: Authors' analysis, 2024

"No Need for Development" Group: This group includes criteria that businesses rated with both importance and performance levels below 3. From the perspective of the surveyed enterprises, applying information technology systems and data analytics to measure the outcomes of marketing, sales, and customer service activities is considered unimportant, and the level of performance remains limited.

"Need for Development" Group: According to the GAP matrix, this group encompasses criteria that businesses rated as having an importance level above 3 but a performance level below 3. Enterprises consider these criteria as highly important in assessing the current state of digital transformation. However, actual performance remains limited and inadequate. This is considered a "gap" that businesses must strive to address, particularly in areas such as the application of digital technologies in marketing or the adoption of customer relationship management (CRM) systems.

### 3.2.2. Gap Matrix Analysis for Strategy

"Right Direction Development" Group: According to the survey results, this group focuses on the process of digital transformation being driven by strategy, where business leaders integrate digital transformation initiatives into the strategic orientation of the enterprise. Both the importance and performance levels of this criterion were rated above 3 points by the businesses. This suggests that it is an important factor for the future and that performance has already achieved a relatively good level. It is considered a strength in the digital transformation efforts of women-owned SMEs.

"No Need for Development" Group: This group includes criteria for which both the importance and performance were rated below 3 by the enterprises. From the businesses' perspective, applying information technology systems and data analytics to support strategic activities such as capital mobilization and seeking strategic investors is not considered important, and their performance remains limited.

"Need for Development" Group: According to the GAP matrix, this group comprises criteria that were rated with an importance score above 3 but a performance score below 3. These criteria are viewed by enterprises as very important when assessing the current state of digital transformation; however, their current performance remains weak and underdeveloped. This is seen as a "gap" that enterprises need to address more proactively, particularly in terms of regularly investing in and committing to technological initiatives aimed at improving business performance and management efficiency.



*Fig.7.1 Gap matrix for Strategy*

Source: Authors' analysis, 2024

### 3.2.3. Gap Matrix Analysis for Infrastructure

"Right Direction Development" Group: The results indicate that this group centers on two specific criteria, HT1 and HT2, both of which were rated by businesses with importance and performance levels exceeding 4 points. This demonstrates that enterprises are performing well in terms of network connectivity and the application of basic technologies to support the digital transformation process. These are not only critical criteria for the future but are also currently being implemented effectively. As such, they represent a key strength in the digital transformation efforts of women-owned SMEs.

"No Need for Development" Group: This group comprises criteria that received ratings below 3 for both importance and performance. From the perspective of businesses, the application of digital technologies to support production and construction activities (e.g., robotics, automation, 3D printing, automatic brand/product recognition technologies) is not considered important, and performance remains minimal.

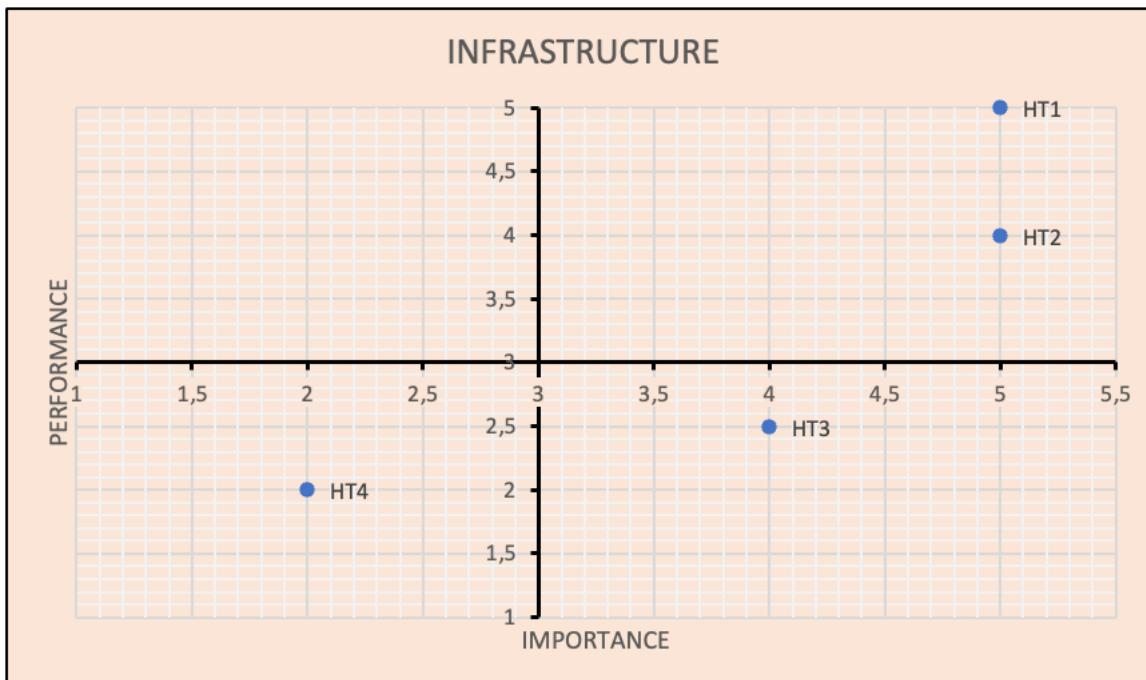
"Need for Development" Group: According to the GAP matrix, this group includes criteria rated above 3 in importance but below 3 in performance. These criteria are seen by enterprises as very important in evaluating the current state of digital transformation; however, their performance is still weak and insufficient. This represents a "gap" that enterprises must actively work to address,

particularly in applying advanced digital technologies such as cloud computing, 5G mobile technology, Internet of Things (IoT) solutions, and Enterprise Resource Planning (ERP) software.

### 3.2.4. Gap Matrix Analysis for Operations

"Right Direction Development" Group: The results indicate that this group centers on the criterion VH1, which was rated by businesses with both importance and performance levels exceeding 4 points. This demonstrates that enterprises are effectively preparing employees to be willing to learn and accept new digital systems as part of the digital transformation process. Thus, this is not only a critical factor for the future but also an area where businesses are currently performing relatively well.

"No Need for Development" Group: This group consists of criteria that enterprises rated below 3 in both importance and performance. From the businesses' perspective, the development of an online knowledge and expertise repository is not considered important, and its performance remains minimal.

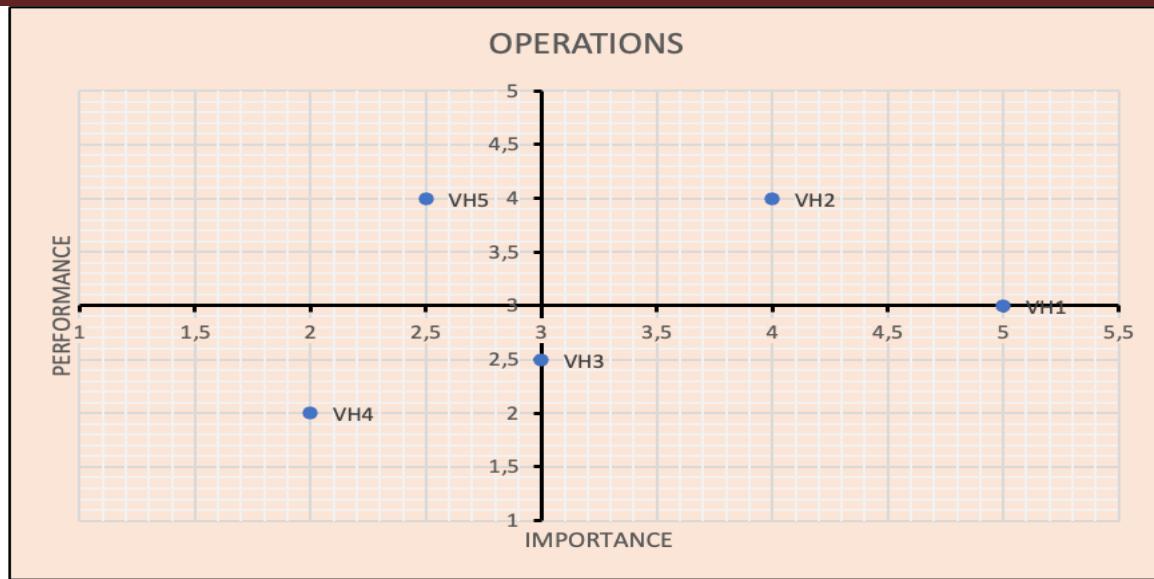


*Fig.7.2 Gap matrix for Infrastructure*

Source: Authors' analysis, 2024

"Overdeveloped" Group: This group includes criteria that were rated below 3 in importance but above 3 in performance. According to enterprises, allocating significant resources to policies for attracting high-quality technology personnel within the sector is not necessary during the digital transformation process. Thus, current investment in this area may be exceeding its perceived value.

"Need for Development" Group: According to the GAP matrix, this group comprises criteria that received importance scores above 3 but performance scores below 3. These are viewed by enterprises as highly important in assessing the state of digital transformation, yet their performance remains inadequate. Businesses believe that more focus should be placed on developing a workforce capable of effectively using existing digital systems.

*Fig.8. Gap matrix for Operations*

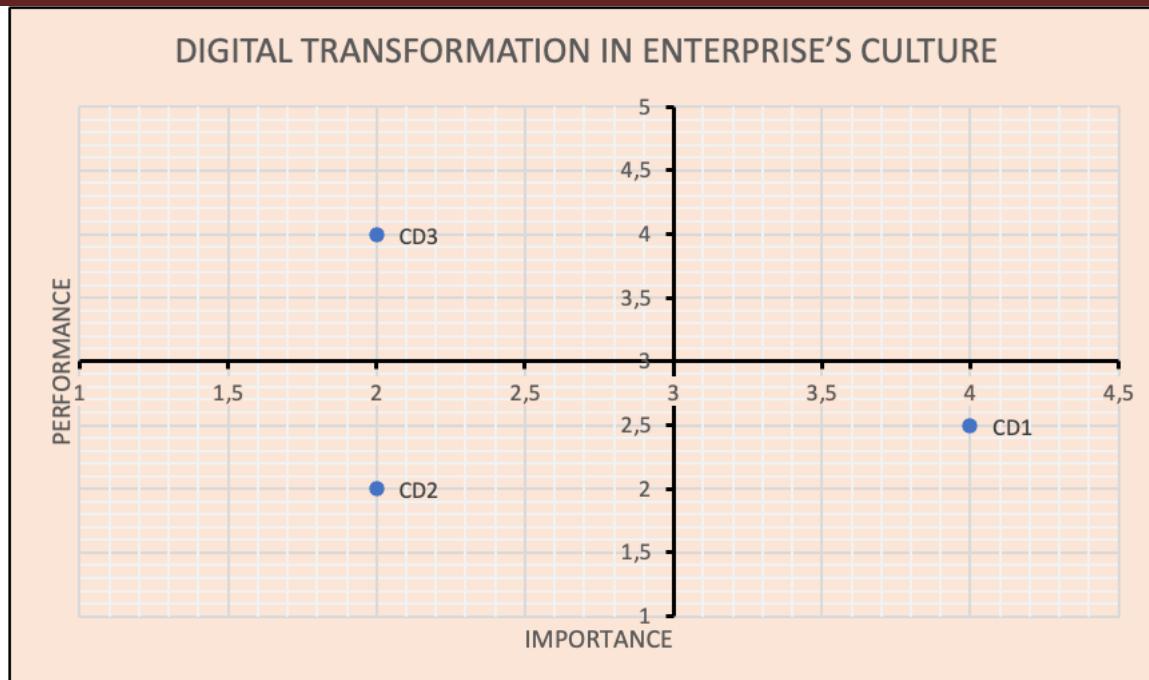
Source: Authors' analysis, 2024

### 3.2.5. Gap Matrix Analysis of Digital Transformation in Enterprise's Culture

"No Need for Development" Group: This group includes criteria that were rated below 3 for both importance and performance. From the perspective of businesses, having a dedicated R&D department to promote a culture of innovation, creativity, and the application of digital technologies is deemed unnecessary in the context of digital transformation.

"Overdeveloped" Group: This group encompasses criteria that received importance scores below 3 but performance scores above 3. Businesses believe that during the digital transformation process, it is not essential to allocate substantial resources to encouraging each individual within the enterprise to independently share knowledge and experience related to digital transformation with one another. Hence, current efforts in this area may exceed actual strategic needs.

"Need for Development" Group: According to the GAP matrix, this group comprises criteria rated above 3 in importance but below 3 in performance. These are considered by businesses to be critical for assessing the digital transformation status, yet their current application remains limited and insufficient. From the enterprise perspective, more attention should be paid to fostering an "ICT culture"—where employees work in an internet-based environment, use corporate email domains, engage in online meetings, and utilize tools such as Office software and smartphones for professional tasks.



*Fig.9. Gap matrix for Digital transformation of enterprise's culture*

Source: Authors' analysis, 2024

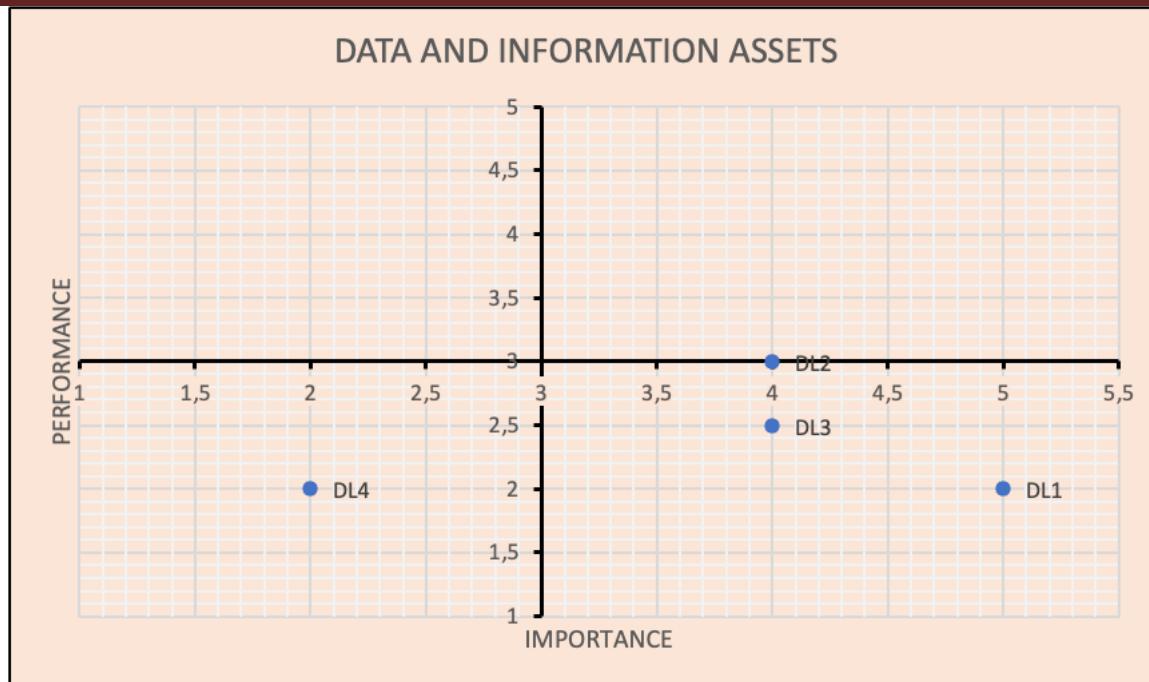
### 3.2.6. Gap Matrix Analysis of Data and Information Assets

"Right Direction Development" Group: The results indicate that this group is focused on the VH1 criterion, which businesses rated above 3 for both importance and performance. This reflects that enterprises are effectively adopting new technologies such as cloud computing and mobile technologies to reduce costs and enhance the efficiency of their IT systems. This criterion is considered important for the future, and enterprises have already made commendable progress in its performance.

"No Need for Development" Group: This group includes criteria for which both the importance and performance levels were rated below 3. From the perspective of the enterprises, building an online knowledge and expertise repository is not regarded as a priority, and performance efforts in this area remain limited.

"Overdeveloped" Group: This group consists of criteria that enterprises rated below 3 in importance but above 3 in performance. According to the businesses, excessive investment in developing policies and procedures related to data collection, storage, and analysis to support business decision-making is not necessary during the digital transformation process. Current efforts in this area may exceed actual strategic needs.

"Need for Development" Group: According to the GAP matrix, this group comprises criteria that were rated above 3 in importance but below 3 in performance. These are seen by businesses as crucial in assessing the status of digital transformation; however, current performance remains weak. From the business perspective, enterprises must regularly update their technological solutions by leveraging the most advanced offerings available from market providers.



*Fig.10. Gap matrix for Data and information assets*

Source: Authors' analysis, 2024

#### 4. Solutions to Promote Digital Transformation in Women-Owned SMEs in Hue city

##### 4.1. DISCUSSION

Based on the research findings, the “Need for Development” group in the GAP matrix consists of criteria that businesses rated above 3 in importance but below 3 in performance. These are the key areas where targeted solutions should be directed to help enterprises advance in the right direction in the future.

Group of Solutions Related to “Customer Experience”: A positive customer experience significantly contributes to a company’s development. Not only does it present opportunities to increase revenue and profit, but it also helps optimize overall business performance. Enterprises are encouraged to adopt technological applications to improve conversion rates in sales activities. SMEs can enhance customer experience by leveraging data platforms from Customer Relationship Management (CRM) software to predict customer behavior and needs, thereby offering personalized promotions and product content tailored to each customer segment. In particular, for women-owned SMEs, the ability to grasp customers’ preferences and tastes is considered a unique advantage. These businesses seek strategies to encourage customers to consent to the use of their data, which in turn allows the enterprise to optimize the customer experience.

To ensure consistency in an omnichannel customer experience, businesses must diversify customer engagement options by expanding brand “touchpoints.” This involves deploying a variety of customer communication tools such as live chat, mobile apps, SMS, Facebook, and other platforms. By doing so, customers can interact with the business across multiple channels, enabling departments such as sales, marketing, and customer service to respond promptly and effectively to customer interactions.

##### Group of Solutions Related to DT Strategy

According to research findings, enterprises that regularly express interest in and invest in technological initiatives to improve business and management efficiency are often assessed as having a low level of implementation. This can be attributed to entrenched business habits that hinder the effective adoption of digital processes. Digital transformation is not merely a set of minor changes—it entails a comprehensive structural overhaul of the enterprise. To successfully lead this transformation, female business leaders must take a proactive and engaged approach in understanding the various components of digital transformation, including hardware, software, associated costs, functionalities, and emerging trends.

In addition, SMEs should prioritize the performance of automation technologies, such as email automation systems or automated production lines. Conducting business exchanges on digital platforms not only helps reduce operational costs but also shortens the time needed for making decisions related to business activities.

### **Group of Solutions Related to Digital Transformation Infrastructure**

Findings reveal that the adoption of advanced digital technologies, such as cloud computing, 5G mobile technology, IoT solutions, and ERP software, among enterprises remains limited, despite these being key criteria in the DT process. According to Thanh and Hiệp (2021), technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and cloud storage are considered critical enablers of successful digital transformation, accounting for 60–70% of an enterprise's success across all DT stages.

However, the adoption of such technologies poses significant challenges for women-led small and SMEs, as women often face greater barriers in accessing and implementing new technologies. To effectively leverage technology, business owners must carefully assess their internal resources and conditions while also evaluating digital solutions based on criteria such as optimization, modernity, trend alignment, and the suitability of specific features.

Technology selection decisions in the context of digital transformation should be aligned with the overarching goal of enhancing customer convenience and ease of access to the company's products and services.

### **Group of Solutions Related to Digital Transformation Operations**

From the enterprise's perspective, a key priority is to develop a workforce capable of effectively utilizing existing digital systems. This is currently a critical weakness that needs to be addressed. Businesses must establish a rigorous recruitment process that selects highly qualified personnel who can effectively master new technologies. In parallel, improving compensation and benefits policies is essential to attract and retain skilled human resources.

One of the main challenges businesses face during digital transformation is the lack of support from employees. In practice, employees may resist or delay changes if they perceive that such transformations threaten their personal interests or job security. Therefore, business leaders should organize meetings and communication campaigns to educate employees on the necessity of digital transformation and to solicit their active support.

In addition, business owners must assist employees in adapting to changes and provide opportunities for them to acquire and update the skills required for the digital transformation process. Enterprises can foster voluntary employee participation by linking their contributions to

specific components of the transformation initiative. This approach encourages employees to take a more proactive role in implementing digital transformation within the organization.

### **Group of Solutions Related to Digital Transformation of Corporate Culture**

According to the findings, , the performance of an “ICT culture”—defined as employees working in internet-based environments, using company-domain emails, participating in online meetings, and utilizing office software and smartphones for work—remains underdeveloped among women-led SMEs in Hue city.

To establish an effective “ICT culture,” enterprises must foster a new, transparent corporate culture and build a DT ecosystem. This ecosystem should integrate cloud storage, traditional tools, platforms, and services with service-oriented architectures and open application programming interfaces (APIs). Such integration is essential to support sustainable DT initiatives.

Businesses are therefore encouraged to simplify, virtualize, and automate the integration of network functions with IT operational processes across multiple cloud environments. Moreover, strengthening cybersecurity measures is vital for the successful development of an ICT-driven corporate culture.

### **Group of Solutions Related to Information and Data Assets.**

The regular updating and adoption of the latest technological solutions from market providers remains inadequately implemented by many enterprises. At the core of DT lies data and information, priceless assets for any organization. These resources are particularly vulnerable to leakage and theft in digital environments.

Therefore, businesses must take a proactive approach in establishing preventive measures against data and information loss. This includes investing in advanced information security services to ensure effective protection and real-time monitoring of corporate data assets

## **4.2. CONCLUSION**

The findings of this study underscore the dual realities facing women-owned SMEs in Hue City: growing awareness of the strategic importance of digital transformation and the persistent challenges in realizing its full potential. Despite policy support and increasing market readiness, several structural and operational deficiencies hinder widespread DT adoption.

Firstly, the area of customer experience emerged as both a strength and an opportunity. Enterprises have made commendable strides in leveraging online sales platforms and basic CRM systems. However, their application of data analytics for customer insights and personalized engagement remains limited. To enhance customer-centric strategies, enterprises must further invest in predictive analytics, personalized marketing, and omnichannel integration.

Secondly, the strategic alignment of digital transformation within broader business objectives remains inconsistent. While enterprises recognize its importance, performance in strategic investment, planning, and leadership commitment is weak. Many businesses lack a coherent digital roadmap, often due to limited knowledge and leadership in digital innovation. Bridging this gap requires capacity-building initiatives aimed at helping female entrepreneurs conceptualize, plan, and lead DT strategies effectively.

Thirdly, digital infrastructure and technology adoption present a mixed picture. Basic ICT systems are prevalent, but the adoption of advanced technologies such as cloud computing, 5G, ERP systems, and automation is insufficient. High costs, lack of digital literacy, and uncertainty about ROI are key barriers. Government and donor agencies must expand financial support and offer curated digital toolkits aligned with SMEs contexts.

Fourthly, internal operations and human resource readiness are significant impediments. Employees often lack the skills or motivation to engage with new digital systems. This calls for a dual approach—recruiting digitally skilled personnel and providing reskilling programs for existing staff. Moreover, change management practices must be embedded into corporate governance to mitigate internal resistance.

Fifthly, the digital transformation of enterprise culture remains an underexplored domain. While digital behavior, such as email usage and online meetings, is partially adopted, broader cultural transformation, such as knowledge-sharing, innovation mindset, and R&D orientation, is lacking. Promoting an ICT-driven culture demands not only tools but also new management practices, digital leadership models, and community-building mechanisms within firms.

Finally, data and information asset management is a cornerstone of successful DT but is currently underutilized. Few businesses regularly update their technological solutions or implement robust data governance frameworks. Given rising cybersecurity concerns, women-led SMEs must invest in data protection mechanisms and adopt secure cloud-based platforms for data storage and decision support.

In conclusion, although women-owned SMEs in Hue City show promising signs of digital engagement, systemic gaps persist in strategy, culture, and technology adoption. Addressing these challenges will require a multi-stakeholder approach, combining enterprise-level initiatives with policy support, technical assistance, and financial facilitation. By equipping women entrepreneurs with the tools, knowledge, and confidence to lead digital change, Vietnam can foster a more inclusive and resilient digital economy. Future research should explore the longitudinal impacts of DT initiatives and comparative analyses across regions to inform national DT strategies for women-led SMEs.

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